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Speed Off

Max Cameron and **Alan Buckingham** debate whether the rationale for speed cameras is based on need or greed

Speed cameras work

Max Cameron

These comments follow the general headings used in Alan Buckingham's article, 'Speed Traps', in the Spring 2003 issue of *Policy*. The article draws heavily on material published by the Association of British Drivers and the Canadian Society for Safety by Education, Not Speed Enforcement, both strong opponents of speed cameras. It includes much superficial analysis purporting to assess the effects of speed cameras in Britain and Australian States. Monash University Accident Research Centre (MUARC) has conducted scientific studies of the effects of speed cameras in Victoria and Queensland, and has ongoing dialogue with those responsible for evaluating the speed camera programme in Britain. MUARC provides these comments from an independent position, free from any prejudice about the role and effects of speed cameras in addressing road trauma.

Does speed kill?

Dr Buckingham focuses on the role of speeding in causing road accidents, and ignores the role of speed in the injury outcome of these accidents. Acknowledgement of this second role is admitted only much later, on page 11 of his article.

There is clear evidence of the causal role of speeding in the scientific 'case-control' studies conducted in urban and rural environments in Australia by Kloeden et al.¹ These studies all show increased risks of casualty crash involvement associated with increasing travel speeds above the applicable speed limits.

A MUARC analysis of the crash outcomes from Kloeden et al.'s 1997 urban study showed that the risk of fatal or serious injury was increased by more than 20%

at speeds 16-30 km/h above the limit, and more than doubled at speeds greater than 30 km/h above the limit.²

Dr Buckingham references a British Transport Research Laboratory study showing that the casualty accident rate on rural roads increases with the average speed of traffic.³ He dismisses the researchers' estimate that a substantial reduction in accidents could be achieved by a drop in speed limit by noting that only 5% of traffic were found to exceed the 60 mph limit. In fact, up to 38% of traffic were exceeding the limit on some rural road sections.⁴ In a later paragraph, Dr Buckingham quotes other research showing that accident involvement rates increased for the fastest 5% of traffic.⁵

As British and Australian research has shown, it is this relatively small proportion of drivers who exceed speed limits who have substantially increased risks of crash involvement (the risk increasing rapidly with travel speed), resulting in speeders being a substantial proportion of the crash involved. The research also shows that the risk of serious injury outcome, once the crash has occurred, also increases rapidly with the travel speed (as could be expected given that kinetic energy, which is likely to be dissipated as personal injury, increases with the square of the impact speed).

The (in)effectiveness of speed cameras in saving lives

Commenting on the British speed camera programme, Dr Buckingham suggests that 'neither a reduction in speeds nor a marked reduction in serious and fatal accidents has been achieved'. This ignores a recently completed evaluation of the first two years of an

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expansion of speed cameras in eight areas of Great Britain.⁶ These overtly-operated, fixed and mobile speed cameras produced a 10% reduction in average speeds at the camera sites, coupled with at least 50% reductions in excessive speeders (exceeding the speed limit by more than 15 mph). Taking into account the long-term downward trend in serious road trauma in the rest of Great Britain, there was an additional 35% reduction in serious casualties (deaths and serious injuries) at the camera sites during the first two years of the expanded programme. The effects of the overt cameras also appeared to generalise across each area (not just confined to the camera sites), with the overall effect being a 4% reduction in serious casualties in addition to the long-term trend.

The analysis of fatality rate trends presented by Dr Buckingham in Figure 1 and surrounding text is not specific to the speed camera sites and areas, and cannot provide any information about the camera effects separate from the effects of the many other factors affecting road trauma in Great Britain. Dr Buckingham's analysis is superficial and misleading.

His analysis of fatal crash trends in Australian States is also superficial and misleading. His claim that a key factor explaining the sharp decrease in fatal accidents in Victoria after 1989 was the increase in fatal accidents between 1988 and 1989 is wrong. Ignoring 1989, the fatality rate per head of population in Victoria fell 33% from 1986-88 to 1990-92 (the period during which the speed camera programme and other major road safety initiatives were escalated) and by 45% to 1992-94 (when the new programmes were operating fully). There was no more than a 10% drop in total travel on Victoria's roads during the early 1990s, but by 1993 it had begun to increase again and eventually exceeded previous levels in 1997.

MUARC has conducted numerous scientific studies of the general and localised effects of Victoria's covertly-operated mobile speed cameras. These studies are summarised in Cameron et al.,⁷ which is readily available from MUARC's website. The research has confirmed that the key mechanism by which the speed camera programme reduces casualty crashes, and their serious injury outcome, is by detecting a high proportion of speeding infringements and issuing speeding tickets to offending drivers.

Dr Buckingham appears to confuse the introduction of mobile speed cameras in New South Wales during 1991 and the subsequent implementation of fixed speed cameras during 1999, both forms of operation being overt in nature (in contrast to Victoria's approach). Hence he is wrong in saying that NSW did not implement speed cameras until 1999. The implication that Victoria's speed cameras were not effective, because

the drop in fatality rate was no greater than the drop in the rate in NSW, is also wrong for the same reason.

Double demerit points

Dr Buckingham asks whether 'is it too much to expect a large reduction in fatal road accidents from speed cameras given their scarcity and low density in Australia compared with, say, Britain?' This presumes that speed cameras are operated in the same way in the Australian States as in Great Britain.

In Victoria, the aim is to reduce illegal speeding generally, not at specific sites alone, and for this reason the cameras are operated covertly so that drivers have the impression that they can be detected at any place at any time. In Queensland, speed cameras are operated overtly, but they are located according to a randomised scheduling system which results in a similar effect to the Victorian operations. A MUARC evaluation has found at least 20% annual reductions in overall road trauma in Queensland, with the greatest reductions being in those Police regions where the scheduling is closest to random.⁸

Thus broad and substantial reductions in serious crashes can be achieved by relatively few speed cameras per unit area, provided they are operated and/or scheduled in ways which maximise the deterrent effect on speeding drivers. This can be successfully achieved by operations which are associated with a perception that there is a risk of being detected speeding anywhere at any time. The overt speed camera operations in Great Britain, predominantly at fixed, sign-posted locations, do not achieve this perception to the same extent.

Dr Buckingham's analysis of the effects of the double demerit points scheme in NSW does not take into account any other factors operating which may distort the apparent effect. However, MUARC has not undertaken any evaluation of the effect of this initiative.

Unintended consequences

Dr Buckingham implies that speed cameras in Britain and Australia have failed to reduce serious road accidents (this has been refuted in studies referenced earlier), and that data from British Columbia, Canada were also unable to show reductions in speeds or road trauma associated with their (since scrapped) speed camera programme. In fact, a scientific evaluation of the British Columbian programme during its first year of operation showed a 2.4 km/h reduction in average speeds and over 40% reduction in vehicles exceeding speed limits by 16 km/h or more. These reductions in speed were accompanied by 25% reduction in daytime speeding-related collisions, 11% reduction in daytime crash victims carried by ambulances, and 17% reduction in daytime traffic fatalities.⁹

Thus Dr Buckingham is not correct in saying that speed camera programmes in Britain, Australia and Canada have not played a role in reducing road fatalities in those jurisdictions. Moreover, his suggestion that these programmes may have caused *more* accidents is pure speculation and completely unsupported. Dr Buckingham goes on to suggest reasons for this (unsupported) increase in crashes. The reasons he proposes are also speculative and unsupported by any evidence.

Remainder of Dr Buckingham's article

Subsequent sections of the article rely on Dr Buckingham's suppositions that speeding is a relatively unimportant problem, and that speed cameras are ineffective and even counterproductive. None of these suppositions is true, and MUARC has provided evidence to the contrary. Hence no further comment on Dr Buckingham's opinions is necessary.

Endnotes

- ¹ C.N. Kloeden, A.J. McLean, V.M. Moore, and G. Ponte, *Travelling Speed and the Risk of Crash Involvement* (CR172) (Canberra: Federal Office of Road Safety, 1997); C.N. Kloeden, G. Ponte, and A.J. McLean, *Travelling Speed and the Risk of Crash Involvement on Rural Roads* (CR204) (Canberra: Australian Transport Safety Bureau, 2001); C.N. Kloeden, A.J. McLean, and G. Glonek, *Reanalysis of Travelling Speed and the Risk of Crash Involvement in Adelaide South Australia* (CR207) (Canberra: Australian Transport Safety Bureau, 2002).
- ² M.H. Cameron, A. Delaney, K. Diamantopoulou, and B. Lough, *Scientific Basis for the Strategic Directions of the Safety Camera Program in Victoria*, Report 202 (Melbourne: Monash University Accident Research Centre, 2003), <http://www.general.monash.edu.au/MUARC/pub2003.htm>
- ³ M.C. Taylor, A. Baruya, J.V. and Kennedy, *The Relationship between Speed and Accidents on Rural Single-carriageway Roads*, Report TRL511 (U.K.: Transport Research Laboratory, 2002).
- ⁴ M.C. Taylor et al., Table 7.
- ⁵ S. Tignor, and D. Warren, 'Driver Speed Behaviour on U.S. Streets and Highways', *Institute of Transportation Engineers: 1990 Compendium of Technical Papers* (August 1990).
- ⁶ A. Gains, R. Humble, B. Heydecker, and S. Robertson, *A Cost Recovery System for Speed and Red-light Cameras—Two Year Pilot Evaluation*, Research paper prepared for Department for Transport, Road Safety Division, U.K., by PA Consulting Group and University College London (11 February 2003).
- ⁷ M. Cameron et al., *Scientific Basis for the Strategic Directions of the Safety Camera Program in Victoria* (see n.2).
- ⁸ S. Newstead and M. Cameron, 'Evaluation of the Crash Effects of the Queensland Speed Camera Programme', *Proceedings, Road Safety Research, Policing and Education Conference* (Sydney: September 2003).
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Speed cameras not the answer

Alan Buckingham

My article 'Speed Traps' aroused considerable interest, including support from a number of those who drive on Australian roads. On the other hand, some researchers and politicians defended their pro-speed camera stance vigorously, including Professor Cameron from Monash University's Accident Research Centre (MUARC). In what follows, I will address some of his criticisms and reinforce some points I made in the original article, which I believe he has not considered seriously enough.

Independence

Independent research on speed policy and speed cameras is vital given the potential impact that government decisions based on such research may have on road safety. It is therefore important to make clear that The Centre for Independent Studies (CIS) did not commission my research, nor did CIS contribute financially to the research or my visit to Australia in October. For the latter, I have my employer Bath Spa University College to thank. Moreover, many of the ideas and arguments underpinning my article were elicited from independently-funded research and websites such as Paul Smith's site (www.safespeed.org.uk), the National Motorists Association of Australia (www.aussiemotorists.com), and others. The test of these ideas and arguments is not where they came from but whether they can withstand refutation from close analysis of the data.

In his response to my article, Professor Cameron assures the reader of the independence of Monash University's Accident Research Centre. Yet Victorian government employees, including representatives from the pro-speed camera bodies VicRoads and the Transport Accident Commission, sit on MUARC's Board of Management. These organisations fund a significant proportion of the Centre's research.¹ The closeness of the research evaluator to such funding bodies may compromise the independence of evaluation. Indeed, this lack of distance led the Queensland Parliament's Travelsafe Committee to comment that the independence of a recent MUARC review might have been compromised by the multiple roles of the architect of Queensland Transport's Random Road Watch programme, who engaged MUARC as consultants to review the programme, acted as primary contact for information requests, and co-authored the published evaluation report.²

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Does speed kill?

Both Professor Cameron and I agree that *excessive* speed kills. Research indicates that those who drive well in excess of the speed limit are at a much higher risk of being involved in a fatal accident. But Professor Cameron does not recognise the minor role that excessive speed plays in accidents. Transport Research Laboratory (TRL) analysis indicates that 93% of accidents are *not* primarily caused by excessive speed. Moreover, excessive speeders tend not to be like ordinary motorists. For example, US research shows that a high proportion of drivers in fatal accidents involving excessive speed were driving illegally—that is, without a valid vehicle licence or under the influence of alcohol. Given that such individuals have already chosen to break the law, it is hard to see how speed cameras will deter them from speeding.³

Regarding the more general relationship between speed, accident risk and injury severity, Professor Cameron refers to the Kloeden et al. reports to support his case. These reports are not as robust or universally accepted as he claims and the 1997 paper in particular has been criticised on methodological grounds.⁴ It is telling that although Professor Cameron wishes to demonstrate that speed kills, in his re-analysis of the Kloeden research he finds that there were so few fatal accidents recorded that the relationship between speed and fatal accidents could not be reliably estimated.

Unable to show that speed kills, Professor Cameron relies on grouping together accidents of varying injury severity—from hospital admissions to fatalities—to make his weaker case that speeding results in more severe injuries. Even this is unconvincing since Professor Cameron finds that travelling at up to 15 km/h above the speed limit is associated with *no* increase in the risk of serious or fatal injury.⁵

The problem is that in some Australian States speed cameras operate at tolerance levels as little as 5 km/h above the posted speed limit. Since nine-tenths of Australian motorists admit to speeding at least some of the time,⁶ the majority of motorists risk being caught for safe driving.

The 1997 Kloeden report claims that for every 5 km/h increase in speed above the speed limit the risk of an accident doubles. Using this sort of logic, those who campaigned against the repeal of the US federal 55 mph speed limit claimed that an extra 6,400 deaths would be caused by increased speeds. Yet in most States the 55 mph limit has been raised, average speeds have increased and since the law's repeal in 1995 the US fatality rate has dropped by over 10%.⁷

The ineffectiveness of speed cameras

While I agree that the analysis of fatality trends is not an entirely satisfactory way of assessing the casual

impact of speed cameras on road fatalities, it seems reasonable to expect that if cameras were as successful as their proponents claim, we should see a visible impact on the fatality trend. Professor Cameron claims there is such evidence and refers to UK research on the impact of speed cameras. However, this research only examined the broad category of 'killed and seriously injured' (KSI) and it does not tell us whether cameras saved lives. In fact, a falling KSI figure may mask a rising fatality trend. One of the UK counties studied—Essex—recorded a 1% drop in KSIs between 2000–2001 while showing a 33% *increase* in fatalities over the same period.⁸

My analysis of Victoria's road fatality trend is also criticised and data is referred to showing impressive drops in fatalities between specific years. However, if this trend is examined over the entire period that cameras have been operational and compared with the national trend, the data look less convincing. Between 1990 and 2001 road fatalities per head of population decreased by 27% in Victoria compared with an overall drop of 35% for Australia.⁹

Professor Cameron argues that the analysis of such trends is 'superficial and misleading', but he does not take account of the weakness of the site-specific analysis of speed cameras on which his own case for the effectiveness of cameras depends. As a 1994 TRL report makes clear, research on the speed/accident relationship, even in a before and after experiment, 'needs to take account of potential changes in factors such as accident reporting, enforcement levels, weather conditions, on street parking, traffic flow variations and changes in vehicle mix'.¹⁰ When speed cameras are installed they are frequently accompanied by such changes. Often the claimed dramatic reductions in fatal accidents at camera sites fail to take account of these confounding factors, undermining the validity of the findings.

Unintended consequences

Perhaps the most serious weakness of Professor Cameron's reply is his failure to address the unintended consequences of speed cameras. That government-funded bodies such as MUARC have not investigated these consequences is no reason to dismiss them, for there are sound logical reasons why speed cameras may cost lives and they deserve further research.

For instance, if motorists believe the message that slower speeds are safer, then risk compensation theory tells us that, perceiving themselves as safer, motorists are likely to take more risks such as tailgating or late braking. Such an effect has been shown with the introduction of seatbelt laws in the UK where 'the law had no effect on total fatalities but was associated with a redistribution of danger from car occupants to pedestrians and cyclists'.¹¹ In short, believing they were

safer when belted, motorists drove in a more dangerous way, which led to the deaths of more pedestrians and cyclists.

Policing and motorists' attitudes

There is clear evidence that speed cameras are changing the way roads are policed as well as the attitude of some police officers towards their job.

The NSW Roads and Traffic Authority predicts that fixed speed cameras will free up police officers to 'perform other functions'.¹² In the UK this has already happened. The British Royal Automobile Club estimates that the proportion of road traffic police officers is a third of its 1990 level.¹³ I argued in my article that without officers policing the roads their ability to catch incompetent, irresponsible and illegal drivers diminishes. Backing this up, data on British road fatalities show that, together with a sharp drop in the number of breath tests over the last four years, the number of drink-related fatalities has reached a ten-year high.¹⁴ There is therefore a *prima facie* case that speed cameras are indirectly implicated in an increase in road fatalities.

Police concern about speed cameras and their role in enforcement is also becoming evident. For example, a recent letter to the *Herald Sun* signed by 'Concerned Sergeants' working in Melbourne expressed frustration about the way in which they believe cameras are being used on roads with artificially low speed limits, low tolerance levels and high revenue-raising potential.¹⁵

Finally, Professor Cameron has failed to address the growing public opposition to speed cameras and the consequences for policing. A recent report by the car insurer AAMI shows that 58% of motorists say that speeding fines are a source of revenue rather than a way to reduce the speed of motorists while 48% felt that it was unfair to penalise motorists travelling only a few km/h over the posted speed limit.¹⁶ In Britain it has moved a worrying step further with a well-publicised report showing that fewer than 25% of motorists would report to the police a speed camera that they saw being defaced.¹⁷

While Professor Cameron sits in his university office churning out reports claiming to show the effectiveness of speed cameras the real, lived experience of motorists and police officers tells a different story. Most people speed at least some of the time and most people know from experience that moderate speeding is not dangerous. Speeding can be safe because, as police accident reports show, the key cause of accidents is not speeding but bad drivers who lack driving skill, who are inattentive or who fail to adjust their driving to meet changing road conditions. No wonder motorists, like some police officers, feel cynically abused by a system set up by bureaucrats and politicians, which they feel has been contrived to raise revenue.

Endnotes

- ¹ See p.7 (for Board of Management) and pp.49-50 (for Financial Statement) of MUARC's *Annual Report 2002*, www.general.monash.edu.au/muarc/muarc02.pdf
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- ³ NHTSA research found that 77% of speeding drivers involved in fatal accidents between midnight and 3am had been drinking, with a BAC of at least 0.01, and 22% were on invalid licences. National Highway Traffic Safety Administration, *Traffic Safety Facts 2002: Speeding*, Washington: DOT, 2003), www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSF2002/2002spdfacts.pdf
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- ⁶ AAMI 2003 *Crash Index*, www.aami.com.au/about/media/fmedia_research.htm
- ⁷ The number of persons killed per 100 million vehicle miles travelled has dropped from 1.69 in 1996 to 1.51 in 2002. National Centre for Statistics and Analysis, *Motor Vehicle Traffic Crash Fatality and Injury Estimates for 2002* (Washington: NCSA, 2003), www-nrd.nhtsa.dot.gov/2002annual_assessment/long_desc_fig_3.htm
- ⁸ Data from Essex County Council, http://194.129.26.30/applications/indepthsites/road_safety.htm
- ⁹ Figures relate to fatalities per 100,000 population, 1990-2001. Australian Transport Safety Bureau, www.atsb.gov.au
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- ¹² www.rta.nsw.gov.au/roadsafety/speedandspeedcameras/fixeddigitalspeedcameras/index.html
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- ¹⁵ *Herald Sun*, 'Police Ashamed of Speed Camera Policy' (23 October 2003),
- ¹⁶ AAMI, 2003, (see n.2).
- ¹⁷ The survey consisted of 1,000 drivers across Great Britain and was conducted by NOP World Automotive in a MotorBus survey on behalf of the RAC Foundation and Autocar (3-5 October and 10-12 October 2003).